



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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Secretary

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Commissioner

RENEWAL OF PILOTING APPROVAL

Pursuant to Title 5, 310 CMR 15.000

Name and Address of Applicant:

Waterloo Biofilter System, Inc.
143 Dennis Street, P.O. Box 400
Rockwood, Ontario Canada N0B 2K0

Trade name of technology and model numbers: Waterloo Biofilter (hereinafter the "System").
Schematic Drawing illustrating Waterloo Biofilter System is attached and is part of this
Approval.

Transmittal Number: W022980
Date of Issuance: May 10, 2002
Expiration date: May 10, 2007

Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental Protection hereby issues this Approval to: Waterloo Biofilter System, Inc., 143 Dennis Street, P.O. Box 400, Rockwood, Ontario Canada N0B 2K0 (hereinafter the "Company"), for Piloting Approval in the Commonwealth of Massachusetts of the System described herein. Sale and use of the System are conditioned on and subject to compliance by the Company and the System owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

Glenn Haas, Director
Division of Wastewater Management
Department of Environmental Protection

Date

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

DEP on the World Wide Web: <http://www.mass.gov/dep>



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I. Purpose

1. The purpose of this Approval is to provide field testing and technical demonstration of the System in Massachusetts, on a Piloting Approval basis, so as to evaluate whether the System can provide an effluent that can be:
 - a. Discharged to the soil absorption system (SAS) at increased loading rates, or
 - b. Discharged to an SAS with a reduced groundwater separation distance.
2. With the necessary permits and approvals required by 310 CMR 15.000, this Pilot Approval authorizes the use and installation of the System in Massachusetts, and requires testing so that the Department can determine whether the System consistently can or cannot function effectively at one or more pilot facilities.
3. The System may be installed only on facilities that meet the criteria of 310 CMR 15.285(2).

II. Design Standards

1. The System is an absorbent trickling filter in which dissolved organic matter and suspended solids are degraded by microbial action in an oxygenated environment. The media in the trickling filter is comprised of 2-inch open-cell foam cubes that allows for microbial growth on the interior surfaces as well as the exterior surface of the foam blocks. The cubes are piled randomly into self-contained baskets that are placed in a suitable enclosure. The sides and top of the baskets are exposed to air circulation through an open meshwork. The baskets can be placed in belowground or aboveground enclosures. The wastewater is applied to the foam blocks by means of spray heads discharging the wastewater from a pump in a pump chamber located between the septic tank and the System. The wastewater percolates down through the foam cubes and out the bottom of the filter. Biomat discoloration occurs in the upper 15 inches of the medium where most of the solids and organic matter are degraded, with the lower section of the filter attenuating bacteria and ammonia. Effluent from the filter shall be disinfected with a Department approved technology whenever the System is installed with a depth to high groundwater less than two feet or whenever the SAS is reduced in size by more than 50 percent as compared to a standard Title 5 SAS.
2. The System shall be installed after a septic tank and pump chamber. The septic tank shall be designed in accordance with 310 CMR 15.223 and the discharge tee shall be equipped with an approved effluent tee filter. The pump chamber shall have emergency storage capacity, above the working wastewater level, equal to the daily design flow of the System and be sized in accordance with 310 CMR 15.231(2) be equipped with both a timed dosing and demand control system. The

System shall be provided with an air ventilation system. Effluent from the System can be recirculated to the septic tank or pump chamber and the remaining effluent shall be disposed by pressure distribution to the SAS. Sampling ports shall be installed at locations specified by the Company to allow for the collection of representative influent, if required, and effluent samples. All sampling locations required by this Approval shall have sampling ports with covers at the ground surface. System shall be installed in series between the building sewer and the soil absorption system of a standard Title 5 system as constructed in accordance with 310 CMR 15.100 - 15.279, subject to the provisions of this Approval

3. Soil Absorption System: The Company seeks to demonstrate that the System can function with a SAS designed with increased loading rates or with a reduced separation distance from the high groundwater elevation by producing an effluent from the System that meets the following parameters:

- a. Biochemical oxygen demand (BOD₅) of 15 milligrams per liter (mg/L),
- b. Total suspended solids (TSS) of 10 mg/L, and
- c. 95 percent removal of Fecal Coliform bacteria.
- d. On remedial sites the Company seeks to demonstrate that, at the high groundwater elevation, the quality of effluent discharged to an SAS reduced in size by more than 50 percent as compared to a standard Title 5 SAS, is likely to be at least equivalent to that of a system designed and constructed in accordance with 310 CMR 15.100 through 15.293. The Company may install Systems to evaluate effluent quality at the high groundwater elevation in accordance with the following:
 - i. **Increased Loading Rates**: SAS shall be designed to allow application rates in accordance with the following table and the effluent from the System shall be monitored in accordance with Section V item 11 of this approval:

Soil Textural Classes Maximum Application Rates¹	
<i>Class</i>	<i>(GPD per sq. foot)</i>
I	3.0 ²
II	2.0 ²
III	1.5
IV	0.75

1. Trench configuration and pressure distribution shall be designed in accordance with Department guidance.
2. Application rates exceeding 1.5 GPD/sf shall not be allowed for sites with a high groundwater elevation less than two feet from the bottom of the SAS.

- e. On remedial sites the Company seeks to demonstrate that the System effluent with a minimum of 18 inches separation distance between the bottom of the SAS, designed with 3 inches of fine sand placed on the bottom of the SAS, and high groundwater elevation is likely to be at least equivalent to that of a system designed and constructed in accordance with 310 CMR 15.100 through 15.293. The SAS can be installed with a minimum 18 inch depth from the bottom of the SAS to the high groundwater elevation to evaluate effluent quality at the high groundwater elevation.
- i. The effluent from the System shall be monitored 18 inches below the bottom of the SAS system in accordance with Section V item 11 of this approval.

II. General Conditions

1. No more than 15 Systems may be installed under this Approval. A representative of the Company shall be onsite to inspect and approve each System installation.
2. All provisions of 310 CMR 15.000 are applicable to the use and operation of this System, the System owner and the Company, except those that specifically have been varied by the terms of this Approval.
3. Any required operation and maintenance shall be performed in accordance with a Department approved plan. Any required sample analysis shall be conducted by an independent U.S. EPA or DEP approved testing laboratory, or a DEP approved independent university laboratory. It is a violation of this Approval to falsify any data collected pursuant to an approved testing plan, to omit any required data or to fail to submit any report required by such plan.
4. The following table lists the monitoring requirements for Systems installed under this Approval. The following parameters shall be monitored: pH, BOD₅, TSS and Fecal Coliform. All monitoring data shall be submitted to the Department and local approving authority within 30 days of the sampling date.

Facility Type	Design Flow (gpd)	Stream	Frequency	Sample Type
Residential	< 2,000	Effluent	Monthly for at least the first 12 months, quarterly thereafter	Grab
Residential	≥ 2,000	Influent & Effluent	Monthly for at least the first 18 months,	composite*
Non-residential	All	Influent & Effluent	Monthly for at least the first 18 months,	composite*

*Unless otherwise specified by the Department, composite sampling shall be determined based on facility operating characteristics.

5. The facility served by the System and the System itself shall be open to inspection and sampling by the Department and the local approving authority at all reasonable times.
6. In accordance with applicable law, the Department and/or the local approving authority may require the owner of the System to cease operation of the system and/or to take any other action as it deems necessary to protect public health, safety, welfare and the environment.
7. The Department has not determined that the performance of the System will provide a level of protection to public health and safety and the environment that is at least equivalent to that of a sewer system. Accordingly, no System shall be installed, if it is feasible to connect the facility to a sanitary sewer, unless as allowed by 310 CMR 15.004.
8. Design, installation and operation shall be in strict conformance with the Company's DEP approved plans and specifications, 310 CMR 15.000 and, with this Approval.

IV. Conditions Applicable to the System Owner

1. The System is approved in connection with the discharge of sanitary wastewater only. Any non-sanitary wastewater generated or used at the facility served by the System shall not be introduced into the System and shall be lawfully disposed of.
2. All samples shall be taken at a flowing discharge point, i.e.- distribution box, pipe entering a pump chamber or other Department approved location from the treatment unit. Any required influent sample shall be taken at a point that will provide a representative sample of the influent. Influent sampling locations shall be determined by the system designer, subject to written approval by the Department.
3. Effluent discharge concentrations shall not exceed treatment standards listed in Section V item 11. The effluent pH shall not vary more than 0.5 standard units from the influent water supply.
4. Operation and Maintenance plan and agreement:
 - a. Throughout its life, the System shall be under an operation and maintenance (O&M) agreement. The first O&M agreement shall be for at least 18 months with the Company. Each subsequent O&M agreement shall be for at least one year.

- b. No System shall be used until an O&M plan is submitted to the Department and the local approving authority which:
 - i. provides for the contracting of a person or firm trained by the Company as provided in Section V item 5 and competent in providing services consistent with the System's specifications and the operation and maintenance requirements specified by the designer and any specified by the Department;
 - ii. contains routine O&M activities specified by the Company necessary for proper operation of the System;
 - iii. contains procedures for notification to the Department and the local approving authority within five days of a System failure or alarm event and for corrective measures to be taken immediately;
 - iv. provides the name of an operator, which must be a Massachusetts certified operator as required by 257 CMR 2.00, that will operate and monitor the System:
 - (1) at the frequency specified in Section III item 4 and anytime there is an alarm event.
 - v. contains an agreement to monitor the System for at least the first 18 months as described in Section V, items 11 through 14.
- c. After the first 18 months of operation, if the System is approved as acceptable by the Department, the owner shall sign at least a one year agreement with an individual or firm with a Massachusetts certified operator of the appropriate grade trained by the Company in accordance with Section V item 5 .
 - i. Effluent discharge limits shall remain as listed in Section V, item 11. Should the System effluent exceed the applicable BOD₅, TSS or fecal coliform limit on two consecutive sampling events, the owner shall have the person or firm contracted to monitor the System submit within 60 days a report to the Department on the reasons for the exceedances with recommendations to prevent future violations.
 - ii. The owner shall submit monitoring data and O & M inspection results to the Department and the local approving authority within 45 days of each sampling date and each inspection date. The inspection results must be recorded on a DEP approved inspection form and a technology checklist, copies of which are attached to this Approval. The forms shall be completed by the operator.
 - iii. After 18 months of operation the owner may request, in writing, a change in the monitoring requirements from the Department.

5. The owner of the System shall at all times have the System properly operated and maintained in accordance with the Company's and the designer's operation and maintenance requirements, the approved procedures and sampling protocol described in Section V item 7 and this Approval.
6. Anytime the operator is changed, within seven days of such change, the owner shall notify the Department and the local approving authority in writing and submit a copy of the new agreement to operate and monitor the System.
7. The owner shall furnish the Department any information, which the Department may request regarding the System, within 21 days of the date of receipt of that request.
8. Prior to transferring any or all interest in the property served by the System, or any portion of the property, including any possessory interest, the owner of the System shall provide written notice of all conditions contained in this Approval to the transferee(s). Any and all instruments of transfer and any leases or rental agreements shall include as an exhibit attached thereto and made a part thereof a copy of this Approval for the System. The System owner shall send a copy of such written notification(s) to the Department and local approving authority within 10 days of such notice being given.
9. Prior to installation of the System, the proposed owner shall submit to the Department the written approval of the local approving authority, together with a copy of the complete application submitted to the local approving authority and a complete BRP WP 64b application and obtain DEP written approval.
10. Prior to the issuance of a Certificate of Compliance for the System, the System owner shall record and/or register in the appropriate Registry of Deeds and/or Land Registration Office, a Notice disclosing both the existence of the alternative septic system subject to this Approval on the property and the Department's approval of the System. If the property subject to the Notice is unregistered land, the Notice shall be marginally referenced on the owner's deed to the property. Within 30 days of recording and/or registering the Notice, the System owner shall submit the following to the Department and the local approving authority: (i) a certified Registry copy of the Notice bearing the book and page/instrument number and/or document number; and (ii) if the property is unregistered land, a Registry copy of the owner's deed to the property, bearing the marginal reference.
11. Within fourteen days of the local approving authority's issuance of the Certificate of Compliance, the owner shall submit a copy of the Certificate of Compliance to the Department.

V. Conditions Applicable to the Company

1. By January 31 of each year, the Company shall submit to the Department a report, signed by a corporate officer, general partner or Company owner, that contains information on the System, for the previous calendar year. The report shall state: the number of units of the System sold for use in Massachusetts during the previous year; the address of each installed System, the owner's name and address, the type of use (e.g. residential, commercial, school, institutional), application rate and the design flow; and for all Systems installed since the date of issuance of the first Piloting Approval for this System, all known failures, malfunctions, and corrective actions taken and the date and address of each such event.
2. The Company shall notify the Director of the Watershed Permitting Program at least 30 days in advance of the proposed transfer of ownership of the technology for which this Approval is issued. Said notification shall include the name and address of the proposed new owner and a written agreement between the existing and proposed new owner containing a specific date for transfer of ownership, responsibility, coverage and liability between them. All provisions of this Approval applicable to the Company shall be applicable to successors and assigns of the Company, unless the Department determines otherwise.
3. The Company shall furnish the Department any information that the Department requests regarding the System, within 21 days of the date of receipt of that request.
4. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval: minimum installation requirements; an operating manual, including information on substances that should not be discharged to the System; a maintenance checklist; and a recommended schedule for maintenance of the System essential to consistent successful performance of the installed Systems.
5. The Company shall institute and maintain a program of operator training and continuing education approved by the Department. The Company shall update the list of trained operators and make the list known to users of the technology.
6. The Company or its designee shall conduct an intended use review of the System prior to the sale of any non-residential unit to ensure that the proposed use of the System is consistent with the unit's capabilities.
7. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval a standard protocol essential for consistent and accurate measurement of performance of installed Systems, including procedures for sample collection and analysis of the System. The protocol shall be in

accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater.

8. The Company shall make available, in printed and electronic format, the referenced procedures and protocol in paragraphs 4 and 7 directly above to owners, operators, designers and installers of the System.
9. The Company shall include copies of this Approval and the procedures and protocol described in Section V (4) and (7) with each System that is sold. In any contract executed by the Company for distribution or re-sale of the System, the Company shall require the distributor or re-seller to provide each purchaser of the System with copies of this Approval and the procedures and protocol described in Sections V (4) and (7).
10. For at least the first 18 months of operation, the Company shall be responsible for operating, maintaining and monitoring the Systems in accordance with Section III, item 4 of this Approval.
11. Influent and effluent from the System shall be monitored as required in Section III item 4. Effluent discharge concentrations from the System shall not exceed 15 mg/L BOD₅, 10 mg/L TSS and a minimum of 95 percent Fecal Coliform removal must be achieved. In addition:
 - a. For systems installed to demonstrate reduced SAS: A groundwater monitoring well shall be installed within 10 feet and directly downstream of the SAS in accordance with the Department's published guidelines and a groundwater piezometer or other DEP approved device for measuring water depth shall be installed within the SAS. The monitoring well shall be tested at the same frequency as listed in Section III item 4 and for the following parameters: Fecal Coliform and ammonia. Each time the System is monitored, the water meter reading, the groundwater elevation in the monitoring well and the water level in the groundwater piezometer shall be recorded.
 - b. For systems installed to demonstrate reduced the groundwater separation distance from the bottom of the SAS: suction lysimeters or other collection devices approved by DEP shall be installed 18 inches below the bottom of the SAS and samples collected and tested for the following parameters at the same frequency as listed in Section III item 4 for the following parameters: Fecal Coliform and ammonia.
 - c. For both system designs the Company shall require that a disinfection device approved by the Department designed to produce a maximum Fecal Coliform effluent concentration of 200 count per 100 ml be installed on the system.
12. During the first 18 months of operation, excluding the first three months of startup operations, if the effluent concentration from the System exceeds 15 mg/L BOD₅, 10 mg/L TSS or fecal coliform reduction is less than 95 percent on two

consecutive sampling events, the Company shall within 60 days submit a report to the Department explaining the reasons for the exceedances with recommendations for operational or design changes to prevent future violations.

13. For at least the first 18 months of operation of each System, the Company shall be responsible for submitting monitoring data and O & M inspection results to the Department and the local approving authority within 45 days of each sampling and inspection date. The inspection results must be recorded on a DEP approved inspection form and a technology checklist, copies of which are attached to this Approval. Accurate completion of the forms shall be the responsibility of the Company.
14. Within 30 days of the end of the first 18 months of operation the Company shall submit a summary report on each system describing the operations of the system, any changes in operation or design that were made during the Piloting period, the final results of the Piloting program for that system and whether the system met the effluent limits for the previous 12 months of operation. That report shall also include either recommendations for approving and ending the Piloting program for that system or recommendations for continuing Piloting for any system that has not performed as planned.
15. The Department will review the report in item 14 above and determine if additional Piloting of the system is required. If the Department determines it is necessary, the Company shall either continue the Piloting program for that system as required by the Department or remove the system and replace it with a fully complying Title 5 system. If the Department determines that the system has performed at the relevant level for at least 12 months, the Company can turn the responsibility for operation and monitoring of the system over to the owner in accordance with Section IV, item 4 of this Approval.
16. If the Company wishes to continue this Piloting Approval after its expiration date, the Company shall apply for and obtain a renewal of this Approval. The Company shall submit a renewal application at least 180 days before the expiration date of this Approval, unless the Department has granted in writing permission for a later date. This Approval shall continue in force until the Department has acted on the renewal application.
17. The Department may require the technology proponent to perform evaluations of system performance, conduct tests, and take corrective action when, based upon a preponderance of the available data and information, it is necessary to take such actions to ensure technology performance conforms with this Approval.

VI. Reporting

1. All notices and documents required to be submitted to the Department by this Approval shall be submitted to:

Director
Division of Watershed Permitting Program
Department of Environmental Protection
One Winter Street, 6th Floor
Boston, Massachusetts 02108

VII. Expiration date

1. Notwithstanding the expiration date of this Approval, any System sold and installed prior to the expiration date of this Approval or any continuation of this Approval, and approved, installed and maintained in compliance with this Approval (as it may be modified) and 310 CMR 15.000, may remain in use unless the Department, the local approving authority, or a court requires the System to be modified or removed, or requires discharges to the System to cease.

VIII. Rights of the Department

1. The Department may suspend, modify or revoke this Piloting Approval for cause, including, but not limited to, non-compliance with the terms of this Approval, non-payment of the annual compliance assurance fee, for obtaining the Approval by misrepresentation or failure to disclose fully all relevant facts or any change in or discovery of conditions that would constitute grounds for discontinuance of the Approval, or as necessary for the protection of public health, safety, welfare or the environment, and as authorized by applicable law. The Department reserves its rights to take any enforcement action authorized by law with respect to this Approval and/or the System against the owner, or operator of the System and/or the Company. The Department reserves the right to monitor any Systems installed for any parameter the Department deems appropriate including but not limited to virus and pathogen testing.